

AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all prior versions, and listings of claims in the application:

1. (Currently Amended) A physiological condition measuring device comprising:

(a) a sensor ~~(11)~~ that includes:

(1) a first light source generating means (69, 421, 423) for providing adapted to provide light along a plurality of first optical measurement paths,

(2) a second light source adapted to provide light along a second optical measurement path, and

(3) a first light detecting means (71, 425, 427) for detecting detector adapted to detect light along the first each of said plurality of optical measurement paths and output a first signal indicative thereof, and

(4) a second light detector adapted to detect light along the second optical measurement path and output a second signal indicative thereof; and

(b) a processing system (141, 445, 452) that controls the said light generated by said light generating means, receives the output of measures light incident upon said the first and the second light detectors detecting means, and produces a measurement indicative of said a physiological condition of a patient based on said measured light the first and the second signals, and wherein the measurement comprises (1) a first measurement common to the first and the second optical measurement paths but distributed independently in the first and the second optical measurement paths, and (2) a second measurement associated with the first optical measurement path and the second optical measurement path.

Claim 2. (Cancelled).

3. (Currently Amended) A measuring device according to claim 1, wherein ~~said light generating means produces the first and the second light sources produce~~ at least two

wavelengths of light along each of ~~said plurality of the first and the second~~ optical measurement paths.

4. (Currently Amended) A measuring device according to claim 3, wherein ~~said the~~ processing system produces ~~said the~~ measurement according to selectively weighted ratios of ~~said the~~ light measured from ~~said the~~ at least two wavelengths along each of ~~said the first and the second plurality of~~ optical measurement paths.

5. (Currently Amended) A measuring device according to claim 3, wherein ~~said the~~ processing system produces ~~said the~~ measurement according to selective weighting of one of ~~said the~~ two wavelengths along each of ~~said the first and the second plurality of~~ optical measurement paths.

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6. (Currently Amended) A measuring device according to claim 1, wherein ~~said the~~ first and the second light source and the first and the second light detectors ~~light generating means~~ and ~~said light detecting means~~ are located on a single probe.

7. (Currently Amended) A measuring device according to claim 6, wherein ~~said the~~ probe comprises a spiral hollow needle ~~(65)~~ suitable for screwing into tissue, comprising a plurality of window areas suitable for light emission and light detection.

8. (Currently Amended) A measuring device according to claim 1, wherein at least one of ~~said light generating means and said light detecting means~~ the first light source, the second light source, the first light detector, and the second light detector comprise a light transmitting fiber.

9. (Currently Amended) A physiological condition measuring device comprising:
(a) a sensor ~~(11)~~ that includes:

(1) light generating means ~~(69, 121)~~ for generating light in at least three wavelengths to provide at least two sets of wavelengths of light, each set containing at least two wavelengths of light, and

(2) light detecting means ~~(71, 125)~~ for detecting light at each of ~~said the~~ wavelengths and outputting a signal indicative thereof; and

(b) a processing system ~~(141, 145, 149)~~ that controls ~~said the~~ light generated by ~~said~~ light-generating means, receives the signal from the ~~measures light incident upon said~~ light detecting means, and produces a measurement corresponding to a weighted combination of ~~said the~~ wavelengths.

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10. (Currently Amended) A measuring device according to claim 9, wherein ~~said the~~ processing system produces ~~said the~~ measurement according to selectively weighted ratios of ~~said the~~ light measured from ~~said the~~ two sets of wavelengths of light.

11. (Currently Amended) A method of measuring a physiological condition comprising:

generating light along a plurality of optical measurement paths;

transmitting ~~said the~~ light along each of ~~said the~~ plurality of optical measurement paths through tissue;

receiving light transmitted along each of ~~said the~~ plurality of optical measurement paths after having passed through ~~said the~~ tissue;

measuring light received in ~~said the~~ receiving step comprising: (1) obtaining a measurement common to both optical measurement paths but distributed independently in each optical measurement path, and (2) obtaining a different measurement associated with each optical measurement path.; and

producing a measurement indicative of ~~said a~~ physiological condition based on ~~said the~~ light measured in ~~said the~~ measuring step.

Claim 12. (Cancelled).

13. (Currently Amended) A method according to claim 11, wherein ~~said the~~ light generating and transmitting steps include producing at least two sets of wavelengths of light along each of ~~said the~~ optical measurement paths, and wherein ~~said the~~ producing step includes ~~produces~~ ~~said producing the~~ measurement according to selectively weighted ratios of ~~said the~~ light measured from ~~said the~~ sets of wavelengths along both of ~~said the~~ optical measurement paths.

14. (Currently Amended) A method of measuring a physiological condition comprising:

generating light in at least three wavelengths to provide at least two sets of wavelengths of light, each set containing at least two wavelengths of light;
transmitting ~~said the~~ light through tissue;
detecting light at each of ~~said the~~ wavelengths;
measuring light detected in ~~said the~~ detecting step; and
producing a measurement indicative of ~~said a~~ physiological condition of a patient based on a weighted combination of ~~said the~~ sets of wavelengths of light measured during ~~said the~~ measuring step.

15. (Withdrawn) A physiological condition measuring device comprising:
an insertion rod (7) having a distal end and a proximal end, with a receiving cavity (33) being defined in said proximal end;
a sensor (11) selectively attached to said distal end of said insertion rod;
a circuit connector (9) having a distal end coupled to said sensor and a free proximal end, said free proximal end of said circuit connector and said receiving cavity of said insertion rod being sized and configured such that the said free proximal end of said circuit connector is selectively insertable into said receiving cavity and maintained in an engaged relationship therewith responsive to being fully inserted into said receiving cavity; and

an introducer tube (5) selectively positioned relative to said insertion rod so as to house at least a portion of said insertion rod therein with said circuit connector extending along at least a portion of a length of said insertion rod between said insertion rod and said introducer tube, said introducer tube being moveable in an axial direction relative to said insertion rod.

16. (Withdrawn) A physiological condition measuring device comprising:

an insertion rod (7);

a sensor (11) selectively attached to a distal end of said insertion rod;

a circuit connector (9) having a distal end coupled to said sensor and a proximal end that selectively couples said sensor to an external circuit;

an introducer tube (5) selectively positioned relative to said insertion rod so as to house at least a portion of said insertion rod therein with said circuit connector extending along at least a portion of a length of said insertion rod between said insertion rod and said introducer tube, said introducer tube being moveable in an axial direction relative to said insertion rod; and

A (1) a mechanism (13) that selectively couples said insertion rod and said introducer tube to maintain said introducer tube in a first position relative to said insertion rod wherein said sensor is located entirely within said introducer tube and that permits said introducer tube to be moved to a second position relative to said insertion rod wherein at least a portion of said sensor is located outside said introducer tube.

17. (Withdrawn) A physiological condition measuring device according to claim 16, wherein said mechanism is a deflectable tab disposed on said insertion rod, said tab being deflectable from a non-deflected position to a deflected position, in said deflected position, said first tab provides a configuration that permits a first portion of said first tab to insert between a portion of said introducer tube and said insertion rod, with said first tab being biased into an engaged relation with said introducer tube to maintain said introducer tube in said first position, and wherein removing said tab from within said introducer tube causes said tab to move to its non-deflected

position out of a path of movement of said introducer tube relative to said insertion rod to permit said introduce tube to be moved to said second position.

18. (Withdrawn) A measuring device according to claim 17, further comprising a first tab (39) provided on a side of said insertion rod opposite a side on which said deflectable tab is located, said first tab being sized and configured to provide a force on said introducer tube opposite a force provided thereon by said deflectable tab responsive to said deflectable tab being biased into said engaged relation with said introducer tube.

19. (Withdrawn) A physiological condition measuring device comprising:
an insertion rod (7);
a sensor (11) selectively attached to a distal end of said insertion rod;
a circuit connector (9) having a distal end coupled to said sensor and a proximal end that selectively couples said sensor to an external circuit;
an introducer tube (5) selectively positioned relative to said insertion rod so as to house at least a portion of said insertion rod therein with said circuit connector extending along at least a portion of a length of said insertion rod between said insertion rod and said introducer tube, said introducer tube being moveable in an axial direction relative to said insertion rod; and
a tab (39) disposed on said insertion rod and extending between said insertion rod and said introducer tube, said tab being sized and configured so as to contact a portion of said circuit connector responsive to said insertion rod being rotated relative to said introducer tube to urge said circuit connector to rotate in a same direction of rotation as said insertion rod.

20. (Withdrawn) A physiological condition measuring device comprising:
an insertion rod (7);
a sensor (11) selectively attached to a distal end of said insertion rod, said sensor and an associated portion of said insertion rod being sized and configured such that said sensor rotates relative to said insertion rod if a torque applied on said sensor by said insertion rod exceeds

a first predetermined amount and said sensor disconnects from said distal end of said insertion rod if a pull-off force exerted on said sensor by said insertion rod exceeds a second predetermined amount, wherein said first predetermined amount of torque necessary to cause rotation is independent of said second predetermined amount of force necessary to cause said sensor to disconnect from said insertion rod;

a circuit connector (9) having a distal end coupled to said sensor and a proximal end that selectively couples said sensor to an external circuit;

an introducer tube (5) selectively positioned relative to said insertion rod so as to house at least a portion of said insertion rod therein with said circuit connector extending along at least a portion of a length of said insertion rod between said insertion rod and said introducer tube, said introducer tube being moveable in an axial direction relative to said insertion rod.

21. (Withdrawn) A physiological condition measuring device according to claim 20, further comprising:

an applicator (21) provide at said distal end of said insertion rod to selectively attach said sensor to said insertion rod, wherein said applicator includes a plurality of walls (41) defining an opening (43), each wall being attached at its base to a remainder of said applicator and being separated from adjacent walls by a slot (45) so that each wall is adapted to flex in a direction generally perpendicular to its base to permit rotation of said sensor within said opening if said torque applied on said sensor by said insertion rod via said applicator exceeds said first predetermined amount, and

wherein said sensor includes a cup (67) and a needle (65) mounted in said cup, said cup having a base portion adapted to fit within said opening defined by said plurality of wall, wherein said base portion includes at least one protrusion (77) on a surface thereof, and wherein an interior surface of at least one of said walls includes a groove (47), said protrusion and said groove being sized and configured such that said grooves selectively receives said protrusion responsive to said base portion of said cup being disposed in said opening of said applicator.

22. (Withdrawn) A physiological condition measuring device according to claim 20, wherein said sensor includes a cup (67) and a needle (65) mounted in said cup, said cup having a slit (81) defined at a side there, said slit providing a passageway from an interior cavity of said cup to an external portion of said cup, said passageway being defined by four walls and being sized to receive said distal end of said circuit connector.

23. (Withdrawn) A physiological condition measuring device comprising:
an insertion rod (7);
a sensor (11) selectively attached to a distal end of said insertion rod;
A | a circuit connector (9) having a distal end coupled to said sensor and a proximal end that selectively couples said sensor to an external circuit, said circuit connector including at least one conductor to carry signals between said distal and said proximal ends, and wherein said circuit connector includes at least one of the following;

(a) a stiffening member (130) provided at said proximal end of said circuit connector to minimize bending thereof,

(b) a shielding layer disposed on at least one side of said at least one conductor, and

(c) at least one slit extending at least partially into said circuit connector in a longitudinal direction thereof to increase a flexibility of said circuit connector; and

an introducer tube (5) selectively positioned relative to said insertion rod so as to house at least a portion of said insertion rod therein with said circuit connector extending along at least a portion of a length of said insertion rod between said insertion rod and said introducer tube, said introducer tube being moveable in an axial direction relative to said insertion rod.

24. (Withdrawn) A physiological condition measuring device according to claim 23, wherein said circuit connector includes at least two conductors to carry signals between said distal and said proximal ends, and further comprising a control unit that transmits signals on said conductors as a differential pair.

25. (Withdrawn) A physiological condition measuring device comprising:

an insertion rod (7);

a sensor (11) selectively attached to a distal end of said insertion rod;

a circuit connector (9) having a distal end coupled to said sensor and a proximal end that selectively couples said sensor to an external circuit;

an introducer tube (5) selectively positioned relative to said insertion rod so as to house at least a portion of said insertion rod therein with said circuit connector extending along at least a portion of a length of said insertion rod between said insertion rod and said introducer tube, said introducer tube being moveable in an axial direction relative to said insertion rod; and

an interface that selectively couples to said proximal end of said circuit connector, said interface including an identification element, said circuit connector being configured such that connecting said circuit connector to said interface operatively couples said identification element to an external circuit that enables said external circuit to detect said identification element.

26. (Withdrawn) A method of forming a needle for use in a physiological condition measuring devices, comprising the steps of:

bending a hollow tube into a "J" shape;

beveling a first end of said tube proximate to said bend in at least three planes to define a point of said needle;

bending said tube from said "J" shape to a "P" shape;

defining at least one opening in said tube at a location generally facing a center of a circular portion of said "P" shape;

threading an optical element into said second end of said tube until a portion of said optical element is located in said window;

securing said optical element in place within said tube; and

bending said tube, including said optical element, into a spiral configuration.